

CHAPTER 10

CUMULATIVE IMPACTS

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CHAPTER 10 CUMULATIVE IMPACTS

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ATTACHMENT

Revised Draft EIS Table 5.3-1 - Summary of Environmental Impacts From Minnesota Projects

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CHAPTER 10

CUMULATIVE IMPACTS

10.1 OVERVIEW AND METHODOLOGY

The Council on Environmental Quality's regulations (40 CFR 1508.7) define cumulative effects as

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

Cumulative impacts comprise the total expected environmental impact on the project area, which may be significantly greater overall than each individually minor action taken, when their effects are examined collectively over a period of time.

The Draft EIS discussed anticipated cumulative impacts throughout the proposed project area, which was defined as the corridor formed by the existing rail line as augmented by the proposed new rail line. SEA provided summary tables in the Draft EIS (Tables 5.1-1 to 5.1-15) illustrating the impacts of each particular project component. SEA collected from Federal, state, and local agencies in Minnesota, South Dakota, and Wyoming information on existing and planned projects that could potentially impact the environment in the vicinity of the both the existing line and the proposed new rail line extension. Although it is difficult to identify every individual activity proposed in the project area, SEA believes it considered the most substantial projects that would contribute to cumulative impacts. In discussing the cumulative impacts of these potential projects in Chapter 5 of the Draft EIS, SEA identified adverse noise and vibration impacts and beneficial socioeconomic impacts as cumulative impacts.

Some commenters on the Draft EIS indicated that SEA had not adequately considered all potential cumulative environmental impacts, such as residential growth in the Rochester area. Others expressed their belief that the proposed project would have national cumulative benefits beyond the rail corridor. Also, several commenters indicated that the proposed bypasses, particularly the Rochester bypass, would encourage growth and development in rural areas that would have cumulative impacts. However, as discussed in preceding chapters in this Final EIS, SEA has not recommended that any of the proposed community bypasses be constructed. Some commenters indicated that SEA failed to consider specific cumulative effects, such as impacts on barge traffic on the Mississippi River, or on national air quality. Finally, some commenters indicated that Table 5.3-1 of the Draft EIS was confusing because it listed alternatives not

previously mentioned or discussed in the Draft EIS (Alternative R-23, R-34, O-35, O-46, and O-57).¹

In reviewing the comments on the Draft EIS, SEA agrees that while some cumulative impacts of the proposed project would be limited to the rail line corridor, others would have broader effects. Therefore, although SEA discussed air quality and Mississippi River barge traffic in the Draft EIS, in light of the comments, it is appropriate to revisit the potential cumulative impacts on barge traffic and air quality in this Final EIS.

The following sections discuss cumulative impact comments and areas where the PRB Expansion Project could potentially be expected to contribute to cumulative environmental impacts.

10.2 AIR QUALITY

In the Draft EIS, SEA included in its analysis of air emissions impacts for each county within which emissions would occur (in keeping with EPA's county-by-county air quality classification) and Class I airsheds that could be affected by emissions from the proposed project.

Some commenters discussed global warming issues, foreseeing both increases and decreases in global warming, and impacts on acid rain and air quality, from the burning of low-sulphur PRB coal. Because the 1990 Clean Air Act Amendments mandate reductions in pollutant emissions, however, an assumption of SEA's analysis was that emissions will definitely fall to the mandated level, producing whatever effect the emissions will have on global warming. The only question is whether electrical utilities will meet these requirements using low-sulphur PRB coal or other options, such as emissions controls, that are available regardless of this project's approval. In order to consider the potential for air quality impacts beyond the project area, SEA expanded its analysis to discuss potential cumulative, national air quality impacts, to which the proposed project could be a contributor.

A wide variety of sources contribute to air emissions within the project area, including heavy equipment and vehicles at the existing coal mines, equipment associated with coal-bed methane development, power generation facilities, vehicles, and other commercial and industrial sources throughout the PRB region. Emissions from locomotives, as they transport coal from the PRB to utilities in the Midwest, combine with other air emissions from agricultural activities, vehicles, commercial, and industrial emissions all along the rail routes used by unit coal trains.

¹ SEA notes that these alternatives should have been listed as R-2³, R-3⁴, O-3⁵, O-4⁶, and O-5.⁷ A revised Table 5.3-1 is included as an attachment at the end of this chapter.

Increased demand for energy (see Chapter 2), the mining and train transport of PRB coal, greater use of coal-bed methane equipment, and the heavy equipment necessary for coal mining will all result in increased emissions. The growth of communities in the PRB and along existing coal routes will also likely increase emissions from vehicular, commercial, and industrial sources. However, SEA does not anticipate significant adverse impacts to air quality due to the relatively undeveloped nature of much of the Midwest and the PRB. In addition, EPA's current program to reduce locomotive emissions will eventually allow nearly twice as many trains to operate in the PRB without an overall increase in locomotive emissions above existing levels. No violations of the National Ambient Air Quality Standards, or the Prevention of Significant Deterioration Increments, are expected.

The Draft EIS included SEA's evaluation of potential impacts to visibility in Class I areas, including Badlands National Park and Wind Cave National Park. Visibility impacts in these areas would result from haze-forming pollutants emitted upwind that contribute to a regional haze. Based on air modeling conducted for the Draft EIS, emissions levels in 2010, considering reductions in locomotive emissions from EPA regulations, would result in 33 days of 5 percent visibility impairment and 12 days of 10 percent impairment at Badlands National Park. Wind Cave National Park would likely experience 72 days of 5 percent visibility impairment and 23 days of 10 percent impairment.

The Draft EIS indicated that the proposed project would result in more locomotives operating along the existing rail line. However, the shortened route of the proposed project would save millions of gallons of fuel per year for the life of the project, resulting in decreases in overall emissions from locomotives transporting PRB coal. SEA also indicated that Alternative C would result in 9 days of 5 percent visibility impairment at Badlands National Park, and 3 days of 5 percent, and one of 10 percent, impairment at Wind Cave National Park at 100 million tons of annual coal transport by DM&E. Other project alternatives would have greater impacts on visibility in these areas (Draft EIS, Appendix E).

Commenters on the Draft EIS indicated that SEA had not considered the environmental benefits to air quality of the proposed project. Some commenters, including DM&E, argued that the proposed project would reduce SO₂ emissions by making PRB coal more available and affordable for electrical utilities, and that emissions containing particulates and NO_x would also be reduced through PRB coal use. These commenters believe that reductions in these pollutants would decrease acid rain and improve national air quality.

It is true that the demand for PRB coal is key to the need for the proposed project, and it is linked to the Clean Air Act Amendments of 1990 that require electricity generators to reduce SO₂ emissions. It is also likely that many utilities will use PRB coal to accomplish the required

reductions. However, SEA notes that while the proposed project may help electricity generators reduce their SO₂ emissions, these reductions are required by law and will therefore occur regardless of project approval. For this reason, SEA does not believe that the proposed project would decrease SO₂ emissions. Since locomotive diesel engines emit insignificant amounts of SO₂, mileage and fuel savings associated with the proposed project would also not result in significant reductions in SO₂.

SEA acknowledges that the proposed project would save millions of gallons of diesel fuel each year, and because diesel engines emit relatively high levels of NO_x and particulates, the project would likely reduce emission of these pollutants in the Midwest. The proposed project would serve markets currently served by carriers using other rail lines, such as those through Nebraska and North Dakota. This traffic would be relocated to South Dakota and parts of Minnesota, decreasing locomotive emissions along other rail lines, many with more traffic than contemplated for this project.

If the proposed project were approved, unit coal trains currently using other routes would be transferred to the DM&E rail line. Locomotive emissions would be reduced along these other coal transport routes, while increased along the DM&E rail line and the routes of those other rail carriers with which DM&E can interchange trains. However, these increases would not be expected to exceed the National Ambient Air Quality Standards or the Prevention of Significant Deterioration Increments. Additionally, compliance with EPA's locomotive emissions standards will further decrease per-locomotive emissions as new locomotives are acquired and others rebuilt. Although an increase in demand for PRB coal would also increase rail operations along non-DM&E rail lines, emissions along other rail lines would not be expected to reach current levels due to EPA-mandated reductions, and overall locomotive emissions in the Midwest would decrease.

Commenters stated that SEA had not considered the cumulative impacts of the proposed project and other air emissions on visibility in Class I areas. They were concerned that emissions from the proposed project could combine with other emissions to affect Class I areas. SEA modeled reasonably foreseeable emissions to determine potential cumulative impacts at Badlands National Park and Wind Cave National Park. Although modeling results were not discussed in the Draft EIS, they were included in Appendix E. The cumulative impact to these Class I areas from the combined proposed project and other existing and anticipated emissions sources is shown in Tables 10-1 and 10-2 below.

Table 10-1 Cumulative Five Percent Impairment Days at Class I Areas*						
Million Tons of Annual Coal Transport	Badlands National Park			Wind Cave National Park		
	Cumulative	Non- DM&E	Difference	Cumulative	Non- DM&E	Difference
20	39	33	6	78	72	6
50	52	33	19	79	72	7
100	57	33	24	84	72	12
* Based on Extension Alternative C. Number of impairment days for other alternatives would be greater.						

Table 10-2 Cumulative Ten Percent Impairment Days at Class I Areas*						
Million Tons of Annual Coal Transport	Badlands National Park			Wind Cave National Park		
	Cumulative	Non- DM&E	Difference	Cumulative	Non- DM&E	Difference
20	14	12	2	25	23	2
50	15	12	3	28	23	5
100	22	12	10	32	23	9
* Based on Extension Alternative C. Number of impairment days for other alternatives would be greater.						

Although implementation of EPA's locomotive emissions regulations would reduce emissions from DM&E's locomotives and those of other rail carriers serving the PRB, additional coal-bed methane development and coal mine development would likely result in greater air emissions, balancing out the reductions in locomotive emissions.

The Surface Transportation Board's December 10, 1998 decision evaluated DM&E's current situation and foresaw "the very real likelihood that, absent the funds generated by this project, DM&E would cease to exist as a viable railroad." Should this occur, products currently transported by rail on DM&E's rail line, would be transported via an alternative mode — most likely trucks. One 100-car freight train transports the equivalent of 400 25-ton semi-trucks. Approval of the No-Build Alternative and cessation of service by DM&E would put on the roads

about 1,200 more semi-trucks per day to replace DM&E's roughly 3 daily trains. Locomotives are more fuel efficient than trucks, so that conversion from rail to truck would increase diesel emissions, as noted in Table 10-3. Loss of DM&E rail service transporting about 60,000 carloads per year could add the emissions of 240,000 trucks to the project area, and many additional thousands of pounds of hydrocarbons, NO_x, and CO yearly.

Table 10-3 Diesel Emissions Produced*			
Mode	Hydrocarbons	Carbon Monoxide	Nitrogen Dioxide
Train	0.46	0.64	1.83
Truck	0.63	1.90	10.17
* Pounds of pollutants produced in moving one ton of cargo 1,000 miles			

In summary, the proposed project would be one of many sources of air emissions within the PRB, along the existing rail line, and within the Midwest. Construction and operation of the proposed project would relocate some locomotive emissions from other existing rail routes for PRB coal to the DM&E line, lowering overall emissions along other lines while increasing them along the DM&E line. Mileage savings from the proposed project would reduce overall locomotive emissions in the Midwest by reducing the diesel fuel burned, and associated emissions, in transporting coal to meet the needs of existing coal users by millions of gallons per year.

10.3 TRANSPORTATION

10.3.1 BARGE TRAFFIC

In the March 5, 1999 Final Scope of Study for this project, SEA noted high uncertainty concerning the future development of a barge loading facility along the DM&E rail line. SEA determined that transfer of DM&E-transported coal to barges for movement on the Mississippi River within the Upper Mississippi River National Fish and Wildlife Refuge was not reasonably foreseeable and did not merit evaluation in the Draft EIS. Comments, including one from the U.S. Fish and Wildlife Service, suggested that potential effects on Mississippi River barge traffic should be evaluated because DM&E had identified power plants on the Mississippi River as a target market. In response, SEA conducted additional investigation of the potential for the proposed project to affect Mississippi River barge traffic.

Coal transport by barge is more cost efficient than transport by truck or rail. One 15-barge tow carries the equivalent of 2.25 unit coal trains, or 900 trucks of coal. A barge can also transport one ton of material more than 500 miles per gallon of fuel, compared to 202 miles per gallon by rail and 59 miles per gallon by truck.

The Army Corps of Engineers (COE) and the Minnesota Department of Transportation (Minnesota DOT) provided SEA with information on shipping terminals on the Mississippi River with the capacity to interchange coal from rail to barge. The upper Mississippi River is subject to seasonal changes that affect barge traffic. Port facilities north of St. Louis, Missouri are closed for part of the winter; the farther north they are, the longer their closure periods from ice on the river. The Mississippi River south of St. Louis is generally considered to be open year-round.² Based on the information from Minnesota DOT and the COE regarding port facilities, SEA eliminated the facilities that do not ship or receive coal. SEA contacted the remaining facilities to determine the level of service provided, the type of products shipped or received by barge, the availability of rail service, and the capacity for loading and unloading coal. The following summarizes the capabilities of these facilities.

- **Great Western Coal and Dock:** On the Mississippi River in St. Paul, Minnesota and served by Union Pacific Railroad (UP). While it has the capacity to unload unit coal trains, it does not currently do so, nor does it load barges with coal. To serve this facility, DM&E would be required to interchange rail traffic with a connecting carrier that could transport the coal to St. Paul.
- **River Services:** In Minneapolis, Minnesota on the Mississippi River and served by Canadian Pacific Railroad (CP). It has the capacity, but currently no contract, to load and unload unit coal trains. As with Great Western Coal and Dock, DM&E would have to interchange coal traffic with a connecting carrier to gain access to this facility.

² Source of information: Telephone conversation with a representative of American Commercial Barge Lines (ACBL), which operates barge service on the Mississippi, Ohio, Missouri, and Illinois Rivers. ACBL transports coal by barge to the upper Mississippi River area, but does not receive shipments of coal from any facility north of the ORBA-Johnson Transshipment Dock in Keokuk, Iowa. ACBL is one of the major barge services on the Mississippi, and is not aware of any facility north of Keokuk, Iowa currently capable of loading a barge from a unit coal train. Based on information from ACBL, the most efficient system for transporting coal by barge is to float a shipment of coal from the south to northern markets and return with grain in the empty coal barges. To barge coal from terminals in the upper Mississippi River would require changes in the existing mode of operation.

- **Dakota Bulk Terminal:** On the Mississippi River in Minneapolis, Minnesota and served by UP. It is equipped to load and unload unit coal trains and has provided this service in the past, but is not currently handling unit coal trains. Use of this terminal to transport coal by barge would require DM&E to interchange coal traffic with a connecting carrier.
- **ORBA-Johnson Transshipment Co. Dock:** On the Mississippi River in Keokuk, Iowa, and the dumping area is served by one rail track that connects to a Burlington Northern Santa Fe rail line (BNSF). It is equipped to load barges with coal for transport on the Mississippi, and rail-to-barge coal shipping is its primary function. The ORBA-Johnson dock uses a rotary dumping method capable of unloading approximately 30 coal cars per hour. As with the other ports capable of shipping coal by barge, DM&E would have to interchange its coal traffic with a connecting carrier to access this facility.
- **Bulk Service Corp. Docks #1 and #2:** In Granite City, Illinois on the east bank of the Mississippi River, across from St. Louis, Missouri, and served by Norfolk Southern Railroad. It is capable of loading and unloading unit coal trains but has no current contracts. Barge service would require that DM&E interchange coal traffic with a connecting carrier.
- **Consolidation Coal Company, Kellogg Dock:** In Kellogg, Illinois on the Mississippi River and served by UP. It is equipped to transfer coal from train to barge, and the rotary dumping area at Consolidation Coal can dump 15 rail cars per hour. Barges coal both north and south on the Mississippi River. Barge service from this facility would require DM&E to interchange coal traffic with a connecting carrier.
- **American Commercial Terminals, Western Terminal Coal Dock:** In St. Louis, Missouri on the Mississippi River, and served by BNSF rail lines. It is equipped to transfer coal from rail car to barge, and currently receives coal trains from the Powder River Basin, destined for Louisiana. None of the barges loaded with PRB coal at this facility would be transported through the Upper Mississippi River Fish and Wildlife Refuge as St. Louis is located south of the Refuge portion of the river. DM&E would have to interchange its coal traffic with a connecting carrier to access this facility.
- **Cora Coal Terminal Dock:** In Cora, Illinois on the Mississippi River and served by UP. It is equipped with a rotary dumper to unload unit coal trains of up to 150 cars, and has two surface loop tracks capable of holding 220 rail cars. It ships about 7 million tons of coal per year, approximately 5 million tons of which come from the PRB. DM&E would have to interchange its coal traffic with a connecting carrier to access this facility.

There are no dock facilities in Winona Harbor capable of transferring a unit coal train to barge. Additionally, space limitations make it currently unfeasible to accommodate the type of unit coal trains contemplated as part of this project or the development of rail-to-barge transfer facilities. Winona has facilities to transfer grain from train to barge and much of the grain DM&E ships is transferred to barge in Winona. The Winona Harbor is served by UP. DM&E interchanges its coal traffic with UP to access this facility.

COE statistics³ for lock and dam operations from 1991 through 2000 (Locks 1, in Minneapolis, through 10 near Guttenburg, Iowa), indicate fluctuations in the tonnage and number of barges per year passing through these locks. Farm products are 60 to 70 percent of the goods shipped by barge on this section of the Mississippi, and a portion of the remainder is coal. According to COE lock and dam personnel, barge tows with individual and multiple barges of coal currently pass through the locks in both directions, currently traversing the Upper Mississippi Fish and Wildlife Refuge. Based on COE records, it is likely that the amount of barge traffic on the upper Mississippi River will continue to fluctuate over the coming years.

SEA also contacted facilities along the Mississippi River that receive coal. SEA identified numerous coal fired electric plants along the length of the river from Wisconsin to Louisiana, some of which use PRB coal. These plants currently receive shipments of coal by rail, barge, or both. Most coal facilities along the Mississippi River that receive PRB coal are served by rail. Facilities receiving coal by barge primarily use eastern coal loaded on barges and shipped up the Mississippi River from the Ohio River. Many of these facilities also have rail access. Should they convert to PRB coal, they could be served by rail. Conversion to PRB coal would require steps such as modifications to combustion facilities and available storage space, which could preclude the use of PRB coal at these facilities.

Based on its additional investigation, SEA has determined that under current circumstances, DM&E could not transfer unit coal trains to a barge loading facility at the DM&E terminus in Winona, Minnesota. The absence of barge loading facilities in Winona to transfer coal from rail to barge would require DM&E to interchange rail traffic with a connecting carrier, which in turn would transport the coal to an existing facility located elsewhere on the Mississippi River that is able to transfer coal from rail to barge.

Port facilities in St. Paul or Minneapolis would be the nearest location for DM&E to transfer a unit coal train to barge. It would not be economically feasible to transport coal north to St. Paul in order to transport it south by barge to regional facilities that could be served by rail.

³ From COE web site, St. Paul District, <http://www.usace.army.mil/navigation>, and COE Mississippi River Project Office data, Hastings, Minnesota.

As previously stated, the upper reaches of the Mississippi River are subject to seasonal closure that makes the shipment of coal by barge impractical during winter months. Similarly, locks and dams can be forced to close during periods of high water, often for weeks at a time, which stops barge traffic on the affected portion of the river. (This situation occurred in the spring of 2001.) These circumstances reduce the reliability of coal delivery by barge.

It appears that DM&E contracts to provide coal to power facilities along the Mississippi River would likely be with facilities currently using PRB coal. Delivery of this coal could occur by rail or by barge, but due to reliability factors discussed above, would probably be by rail. Moreover, even if particular facilities were to elect to receive coal by barge, these barges would likely replace barges currently being used to transport coal to the facility and could even be loaded at the same location. Thus, no increase in the number of barges would occur. Nearly all the facilities in DM&E's identified primary market areas are served by rail and most of these plants are within a relatively short distance from DM&E's existing rail line. Accordingly, it would generally be inefficient to transfer the coal to barges.

The Board, in its December 10, 1998 decision, indicated that the Upper Mississippi River market represents 6.7 million tons of coal, with approximately one-third (2.2 million tons) originating in the PRB. The Board indicated that this market could shift to a greater percentage of PRB coal with DM&E acquiring 42 percent (2.8 million tons) of the market. This would be the equivalent of approximately one unit coal train per day, or seven trains per week. At approximately 2.25 100-car trains per 15 barge tow, this would equate to approximately 3 additional tows per week. Some, if not most, of this coal would likely be transported by rail. Some may already be transported by barge. Any barge transport would most likely replace existing barge shipments. Any changes in barge traffic due to the proposed project would be within the fluctuations currently experienced.

In sum, DM&E has no means of transferring unit coal trains to barge without interchanging with a connecting carrier, and the amount of coal that could potentially be interchanged with a connecting carrier is highly speculative. Only small amounts of PRB coal are transported by barge on the Mississippi River with most facilities receiving PRB coal by rail. For these reasons, SEA believes it is unlikely that coal associated with the proposed project would be transported in large quantity by barge. Therefore, the proposed project would have no cumulative impact on river barge traffic.

10.3.2 MIDWEST REGIONAL RAIL INITIATIVE

SEA received comments regarding the proposed high-speed rail corridor between Minneapolis/St. Paul and Chicago. Commenters noted that the construction of a Rochester

bypass could provide a section of rail line within the Interstate 90 corridor for use as part of this high-speed rail route. SEA investigated the Midwest Regional Rail Initiative as part of the preparation of the Draft EIS and determined that the project was still in the conceptual stage. SEA determined that, should the project ultimately go forward, it would likely be many years before high-speed rail would be developed between Chicago and Minneapolis/St. Paul.

In response to comments, including those of Minnesota State Senator Sheila Kiscaden, SEA conducted additional investigation into the Midwest Regional Rail Initiative. This information is discussed below.

The Midwest Regional Rail Initiative is a proposal to restore rail passenger service to cities throughout a nine-state area in the Midwest, including Missouri, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio. Passenger service would be provided between Midwestern cities by high speed trains operating over approximately 3,000 miles of primarily existing freight rail lines. The proposal is estimated to cost \$6 billion.⁴ These costs would be used to make rail lines suitable for high-speed trains, construct and improve train stations, and acquire rolling stock (passenger cars and locomotives). The initiative calls for the Federal government to provide up to 80 percent of the project funding (\$4.8 billion). To date, no Federal funding has been approved or appropriated. Of the nine states, only three have committed funds for the project. Additionally, some of the states are unsure that sufficient revenue can be generated to support the project.

Based on its additional investigation of the Midwest Regional Rail Initiative, SEA reaffirms its conclusion in the Draft EIS that the project is, at this point, still speculative. Therefore, SEA does not consider the initiative to be a reasonably foreseeable future action and does not consider it to be a cumulative impact of this project.

10.3.3 ROAD INITIATIVES

Finally, as discussed in the Draft EIS, numerous road construction projects are planned throughout the project area. These construction projects include road widening and resurfacing that would likely cause traffic delays. Construction and development projects throughout the project area would also be expected to contribute to traffic delays and congestion. These projects would also potentially lead to emergency vehicle delay due to the general increases in traffic congestions they would create.

⁴ Zeitz, R.A. 2000. *A Return Trip for Regional Rail Service*. RAIL. Published by Community Transportation Association of America, Washington, D.C. Winter, 2000.

10.4 CONCLUSION

SEA reaffirms its conclusion from the Draft EIS identifying adverse noise and vibration impacts and beneficial socioeconomic impacts as cumulative impacts.

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**Table 5.3-1
Summary of Environmental Impacts From Minnesota Projects**

	M-2 ¹	M-3 ²	R-2 ³	R-3 ⁴	O-3 ⁵	O-4 ⁶	O-5 ⁷	Rail Yards	DM&E Rebuild	Road projects	Airport Project	Highway construction	Quarry	Cumulative effect
GEOLOGY & SOILS	MTA	MTA	MLA	SLA	MLA	MLA	MLA	MLA	MTA	N	MLA	MLA	SLA	MLA
LAND USE														
Agriculture	MLA	MLA	MLP	MLP	MLA	MLA	MLA	SLA	MTA	N	MLA	MLA	SLA	MLA
Residential	STA	MLA	SLA	MLA	MLA	MLA	MLA	MLA	MLA	N	N	MLA	MLA	MLA
Business	STA	SLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	N	N	N	N	MLA
Public	SLA	SLA	MLA	N	N	N	N	MLA	MLA	MLA	N	N	MLP	MLA
WATER RESOURCES														
Surface water & Wetlands	SLA	MLA	MLA	SLA	MTA	MTA	MTA	SLA	MTA	N	MLA	MLA	MLA	MLA
Ground Water	N	N	MLA	SLA	N	N	N	MLA	N	N	N	N	MLA	MLA
AIR QUALITY	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	N	MLA	MLA	MTA	MLA
NOISE & VIBRATION	MLA	SLA	SLA	MLA	SLA	SLA	SLA	MLA	SLA	MTA	MLA	MLA	STA	SLA
BIOLOGICAL RESOURCES														
Vegetation	MTA	MTA	MTA	MTA	MTA	MTA	MTA	SLA	SLA	N	MLA	MLA	MLA	MLA
Wildlife	MTA	MTA	MTA	MTA	MTA	MTA	MTA	MTA	MLA	N	MLA	MLA	MLA	MLA
Fisheries	MTA	MTA	MTA	MTA	MTA	MTA	MTA	MTA	MTA	N	N	MTA	N	MTA
Threatened & Endangered	N	N	N	N	N	N	N	N	MLA	N	N	N	N	MLA
TRANSPORTATION	MTA	MTA	MLA	MLA	MTA	MTA	MTA	MLA	MLA	MLP	MLP	SLP	N	MLA
SAFETY	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	SLA	MLP	N	MLP	MLA	MLA

**Table 5.3-1
Summary of Environmental Impacts From Minnesota Projects**

	M-2 ¹	M-3 ²	R-2 ³	R-3 ⁴	O-3 ⁵	O-4 ⁶	O-5 ⁷	Rail Yards	DM&E Rebuild	Road projects	Airport Project	Highway construction	Quarry	Cumulative effect
HAZARDOUS MATERIALS	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ENERGY RESOURCES	N	N	MLP	MLA	MLP	MLP	MLP	MLP	MLP	N	N	N	N	MLP
CULTURAL RESOURCES	MLA	MLA	MLA	MLA	MLA	MLA	MLA	N	SLA	N	N	N	N	MLA
SOCIO-ECONOMIC	SLP	SLP	SLP	SLP	SLP	SLP	SLP	SLP	SLP	N	MLP	MLP	MLP	SLP
RECREATION	SLA	SLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	N	N	MLP	N	MLA
AESTHETICS	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLP	N	MLA	MLA	MLA

Legend:

S- Significant impact expected

M- Minor impact expected

N-No impact expected

L-Long-term impact expected

T- Temporary impact (during construction)

A- Adverse impact

P- Positive

¹ Alternative M-2 is the construction of a 13.3-mile new rail line bypass around the south side of Mankato, Minnesota.

² Alternative M-3 is the reconstruction of 10.1 miles of existing rail line and construction of 5.5 miles of new rail line within existing Union Pacific right-of-way through Mankato, Minnesota.

³ Alternative R-2 is the reconstruction of 23.3 miles of existing DM&E rail line through Rochester, Minnesota.

⁴ Alternative R-3 is the construction of a 34.1 mile bypass south of Rochester, Minnesota.

⁵ Alternative O-3 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the construction of a 2.9 mile I&M connecting rail line.

⁶ Alternative O-4 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the construction of a 1.7 mile I&M connecting rail line.

⁷ Alternative O-5 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the reconstruction of an existing I&M connection within existing rail line right-of-way.